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10/661,752	09/12/2003	Darwin Mitchel Hanks	200313596-1	8149

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EXAMINER	
LAMB, CHRISTOPHER RAY	
ART UNIT	**PAPER NUMBER**
2627	

DATE MAILED: 05/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/661,752	HANKS, DARWIN MITCHEL	
	Examiner	Art Unit	
	Christopher R. Lamb	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3 total*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 6-8, 19-21, 30, 33, and 40-42 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 6, terms A0, A1, A2, B1, B2, DC0, QS1, QS2, QC1, and QC2 are not defined.

Regarding claims 7 and 8, function Wk is not defined: it may be that it is itself the signal generated by the actuator control signal generator, in which case it would be defined, but the phrase "according to" seems to imply that it is instead a separate function that influences the generating of the actual signal.

Regarding claims 19-21, 30, 33, and 40-42, they are similar to claims 6-8.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 4, 5, 10, 11, 14, 17, 18, 22, 23, 25, 28, 29, 31, 35, 38, 39, and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Hajjar et al. (US 5,742,573).

Regarding claim 1, Hajjar discloses a system for providing a signal to an actuator within an optical disk drive, to focus optics on an optical disk within the optical disk drive (abstract), wherein the system comprises:

an error term generator configured to generate an error term (column 5, lines 1-11, where the details are similar to column 4, lines 15-18);

an adaptation coefficient configured to regulate a rate at which the error term modifies an actuator control signal (column 5, lines 1-11, where the details are similar to column 4, lines 53-57: if the feedforward signal is averaged with previous iterations there must be a coefficient configured to regulate the rate at which the error term modifies it); and

an actuator control signal generator to generate the actuator control signal, wherein the actuator control signal is a function of a prior actuator position, the error term and the adaptation coefficient (column 5, lines 1-11, where the details are similar to column 4, lines 46-57).

Regarding claim 4, in Hajjar the error term generator is configured to calculate the error term for every new actuator control signal generated by the actuator control signal generator (Hajjar's apparatus always calculates uses the error term to generate the control signal).

Regarding claim 5, in Hajjar the actuator control signal generator additionally comprises:

a coefficient generator to generate coefficients as a function of inputs comprising the adaptation coefficient and the error term (column 4, lines 37-57); and

a Fourier subroutine to generate the actuator control signal using the coefficients generated (column 45, lines 37-57).

Regarding claim 10, the system of Hajjar is a baseline actuator positioning routine to set a baseline voltage level (the end product is a signal – a baseline voltage level – that is applied to the focus servo during focusing operation).

Regarding claim 11, in Hajjar the baseline voltage level includes an AC component (it alternates based on the surface height deviations on the disk).

Regarding claims 14, 17, 18, and 22, a processor-readable medium comprising processor-executable instructions corresponding is inherent to Hajjar. Otherwise these claims are similar to claims 1, 4, 5, and 10, and are rejected for the same reasons.

Regarding claim 23, the processor-readable medium of Hajjar additionally comprises instructions for creating a baseline signal, wherein the baseline signal is different in different sectors of the disk (it is different wherever there is a surface

deviation, so even though Hajjar does not specifically measure sector-by-sector the signal is inherently different in different sectors of the disk).

Regarding claims 25, 28, 29, and 31, they are method claims corresponding to the earlier and are met when the system operates.

Regarding claims 35, 38, 39, and 43, they are similar to the earlier claims, and are rejected for the same reasons.

6. Claims 1, 4, 7, 9, 14, 17, 20, 21, 25, 28, 33, 34, 35, 38, 41, and 42 are rejected under 35 U.S.C. 102(b) as being anticipated by Faucett (US 2002/0089906).

Regarding claim 1, Faucett discloses a system for providing a signal to an actuator within an optical disk drive, to focus optics on an optical disk within the optical disk drive (paragraph 7), wherein the system comprises:

an error term generator configured to generate an error term (paragraph 15);

an adaptation coefficient configured to regulate a rate at which the error term modifies an actuator control signal (there are several: for example term A in equation 3); and

an actuator control signal generator to generate the actuator control signal, wherein the actuator control signal is a function of a prior actuator position, the error term and the adaptation coefficient (equation 3).

Regarding claim 4, in Faucett the error term generator is configured to calculate the error term for every new actuator control signal generated by the actuator control signal generator (obvious from equation 3).

Regarding claim 7, in Faucett the actuator control signal is configured to generate a signal according to Wk(new)=Wk(old)-Mu*Ek, wherein Ek is the error term and Mu is the adaptation coefficient (this is similar to Faucett's equation 3: Y(n) corresponds to Wk(new), Y(n-1) to Wk(old), Mu to A, and Ek to E(n); there are other components to Faucett's equation but the signal is still generated "according to" these parts).

Regarding claim 9, in Faucett the actuator control signal generator is configured, if an angular disk speed of the optical disk drive is sufficiently high, to shift a phase of terms within the actuator control signal to reduce actuator resonance (paragraph 28; the response time of the compensator can be improved – presumably necessary at a higher speed – but it shifts the phase of the actuator signal).

Regarding claims 14, 17, 20, 21, 25, 28, 33, 34, 35, 38, 41, and 42, they are similar to claims 1, 4, 7, and 9, and are rejected for the same reasons.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 2, 3, 15, 16, 26, 27, 36, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hajjar et al. (US 5,742,573) in view of Shoda et al. (US 5,477,333).

Regarding claim 2, Hajjar discloses a system as discussed above.

Hajjar does not disclose "wherein the error term generator is configured to generate the error term using a FES signal as input."

Hajjar is trying to detect the surface height deviations of the disk (column 2, lines 10-11). Hajjar does so by focusing the lens and then detecting the lens position, which is parallel to the disk. However, directly detecting the surface height deviations would be more efficient.

Shoda discloses a method of detecting the distance between a lens and a measured surface (abstract). The method involves detecting a focus error signal "which represents a difference between a distance of the object lens from the measured surface" (abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Hajjar as taught by Shoda to replace the focusing and lens position detecting steps of Hajjar with directly measuring the FES signal. The motivation would have been to simplify the measuring process, which would make it both more reliable and more efficient.

In Hajjar as modified by Shoda, the error term generator would be configured to generate the error term using a FES signal as input.

Regarding claim 3, Hajjar discloses sampling the position sensor signal and using an A-to-D converter to produce the error term (column 5, lines 29-37); in Hajjar in view of Shoda, then, the error term generator is configured to sample the FES signal and use an A-to-D converter to produce the error term.

Regarding claims 15 and 16, Hajjar in view of Shoda inherently includes a processor-readable medium; all other elements of these claims have been discussed.

Regarding claims 26, 27, 36, and 37, they are similar to claims 2 and 3 and rejected for the same reasons.

9. Claims 6, 19, 30, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hajjar (US 5,742,573).

Regarding claim 6, as the terms in the claim have not been defined, it is difficult to understand this claim (see 112 rejection above). However, as the examiner understands the claim, the coefficients are the coefficients of a Fourier series representation of the error signal, where the Mu term is the adaption coefficient from claim 1 which regulates the rate at which the error term modifies an actuator control signal.

Hajjar does not disclose these specific equations for the coefficients. However, Hajjar does disclose creating the coefficients of a Fourier series representation (column 4, lines 37-56), and Hajjar discloses further refining the representation by averaging coefficients with previous iteration coefficients (column 4, lines 37-56). Given that the fundamental principles of Hajjar's Fourier series representation are the same, the equations are simply mathematical details of the particular Fourier series and averaging technique used, and it would have been obvious to one of ordinary skill in the art at the time of the invention to produce the coefficients as claimed.

Regarding claims 19, 30, and 40, they are similar to claim 6 and rejected for the same reasons.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Faucett (US 2002/0089906) in view of Hajjar (US 5,742,573).

Faucett discloses a system as discussed above.

Faucett does not disclose "wherein the actuator signal generator is configured, at disk rpm high enough to result in actuator resonance, to filter Ek values with a digital filter model of an inverse of the actuator frequency response before adapting each Wk."

Hajjar discloses filtering Ek values with a digital filter model of an inverse of the actuator frequency response before adapting each Wk (column 5, lines 32-37).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Faucett as taught by Hajjar to include filtering Ek values with a digital filter model of an inverse of the actuator frequency response before adapting each Wk.

The motivation would have been to avoid errors caused by the actuator frequency response.

11. Claims 12-13, 24, 32, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hajjar et al. (US 5,742,573) in view of Kadlec et al. (US 6,813,226).

Hajjar discloses a system as discussed above, including a baseline actuator positioning routine to establish a baseline signal for application to an actuator.

Hajjar does not disclose "wherein the baseline actuator positioning routine is configured to: step an actuator through a full range of focus; record a maximum value of the SUM signal data obtained within the full range of focus; and set the baseline signal

according to an input to the actuator which resulted in close to the maximum value of the SUM signal data."

In fact, although Hajjar discloses that the lens focuses on the disk as part of the routine (column 2, lines 3-5), Hajjar does not disclose any details of the focusing system.

Kadlec discloses a focusing system including calculating a focus sum threshold (column 3, lines 28-42). The focus sum threshold is used to determine if a focus is acceptable (column 55, lines 35-49). Calculating a focus sum threshold comprises: stepping an actuator through a full range of focus (column 55, lines 15-24); recording a maximum value of the SUM signal data obtained with the full range of focus (column 55, lines 32-34); and setting the focal sum threshold close to the maximum value of the SUM signal data (column 55, lines 35-49).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Hajjar to include the focusing system disclosed by Kadlec, including the step of calculating the focus sum threshold. The motivation would have been to allow data to be reliably read from and written to the optical media, which Kadlec system does (Kadlec, column 2, lines 46-49).

Since focusing is part of the baseline actuator positioning routine of Hajjar, Hajjar in view of Kadlec includes wherein the baseline actuator positioning routine is configured to: step an actuator through a full range of focus; record a maximum value of the SUM signal data obtained within the full range of focus; and set the baseline signal

according to an input to the actuator which resulted in close to the maximum value of the SUM signal data.

Regarding claim 13, in the teachings of Kadlec, the input to the actuator which resulted in close to the maximum value of the Sum signal data is set to approximately 75% of the maximum value (this is within the acceptable range disclosed by Kadlec: column 55, lines 35-49).

Regarding claim 24, Hajjar in view of Kadlec inherently includes a processor-readable media comprising processor-executable instructions. Otherwise this claim is similar to claim 12, and is rejected for the same reasons.

Regarding claim 32 and 44, they are similar to claim 12 and are rejected for the same reasons.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Andrews, Jr. et al. (US 4,628,379), Kim (US 6,714,492).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher R. Lamb whose telephone number is (572) 272-5264. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (571) 272-7589. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CRL 4/28/06

THANG V. TRAN
PRIMARY EXAMINER